

Twentieth International Conference on Screening for Lung Cancer

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Summary Statement

At this 20th Conference, ten years since the initial one, a comprehensive review of the state-of-the-art of screening for lung cancer was presented. The results of research on screening were reviewed, focusing on issues and concerns that remain to be addressed. Since the 1st Conference, the global burden of lung cancer has continued to increase and is estimated to reach about 3.5 million by 2030, twice as many as in 2005, and of those diagnosed with lung cancer in the absence of screening, the proportion dying from this disease remains unchanged at 85%-90%.

An important focus of the I-ELCAP collaboration has been the development of data that informs the decision of the individual considering screening. The current recommendation in the United States is that people at risk of lung cancer should discuss the issues with their physician. For this discussion, information on the potential benefit and risks needs to be available. To underscore the importance of such individualized decision-making, the perspective of a man who is at risk for lung cancer due to his history of smoking was presented. He spoke about his considerations and careful information-gathering prior to undergoing CT screening in I-ELCAP. After weighing the risks and benefit he chose to be screened and described why he will continue to do so.

Another session was focused on the diagnostic yield of screening regimens and the importance of the details of the regimen to the attainment of a high proportion of small lung cancers among those diagnosed as a result of the screening. Investigators throughout the world presented their different regimens and the respective distributions of the cancers at diagnosis. Those results varied but were generally in accord with those reported by I-ELCAP.

Yet another session addressed the potential burdens of screening -- additional imaging, biopsies, unnecessary surgery, radiation exposure, and anxiety of the participant. The importance of the regimen of screening in minimizing these burdens was stressed and relevant results in I-ELCAP and NELSON trial were presented. Discussion emphasized the need for guidelines or what would be ideal and allowable parameters for each of the potential consequences of screening. The NELSON has reported that the main anxiety for participants in the screening program was waiting for the results of the CT scan. Thus this waiting time needs to be the minimum possible.

As there have been marked advances in CT imaging in the past 10 years and knowledge has been acquired, possible modifications in the I-ELCAP regimen need to be considered. The new scanning techniques now provide more detailed information on nodules as well as other findings, and with ever smaller radiation doses. While there have been many updates of the regimen, its basic structure has remained unchanged. With improving technology, additional quantitative information on emphysema and coronary artery calcifications is being acquired, which may provide for more closely individualized risk stratification. The improved technology has also improved the assessment of change in nodule volume and the errors in such assessment have been identified and quantified. Continued improvements in these techniques will decrease the need for needle and surgical biopsies. Techniques of image analysis have progressed but have been hampered by a lack of appropriate databases for testing and validation. I-ELCAP is preparing new databases in addition to those already made available for this purpose. Molecular analyses of cytologic specimens have progressed so that information on biomarkers can be reliably obtained from fine needle aspiration biopsy or bronchoscopy. These have begun to provide valuable prognostic information for personalizing the intervention after lung cancer is diagnosed. As these

approaches improve, consideration should be given to the possibility that the screening interval can justifiably be increased from annual to biannual or an even longer interval.

The prognostic implications of the screen-diagnosed cancers were discussed in terms of their genuineness and curability. From review of the growth and pathology data, it was estimated that less than 10% of the cancers diagnosed in annual rounds of screening were slow-growing cancers and that these could be identified by their CT and pathology appearances. The percentage is higher in the baseline round, but these too could be identified based on their CT and pathology appearances. Thus, the combined CT and cytology information becomes even more important in determining the appropriate intervention by distinguishing, for example, carcinoids and adenocarcinoma in situ from aggressive cancers .

Dr. Susan Dentzer provided an exciting luncheon lecture as she provided insight into the United States system of healthcare and the high level discussions that were underway on Capitol Hill and which will undoubtedly increase in frequency and intensity over the next several months.

The pathology of early lung cancer was discussed by the I-ELCAP expert panel of on pulmonary pathology. It has reviewed the resected cases of lung cancer in I-ELCAP in its many meetings over the past 10 years. New criteria for the diagnosis and staging of lung cancer are being developed, which will allow for further personalization of intervention, including use of limited resection.

Research areas other than those concerned with lung cancer have emerged as a result of having performed CT screening. These include targeted advice on smoking cessation delivered at the time of the CT screening, which has achieved high levels of smoking cessation per encounter. The identification and quantification of emphysema and coronary artery calcifications have been shown to be acceptable on low-dose, ungated, non-contrast CT and provide useful prognostic information. Computer assessment of these findings is also being developed so that consistent assessment can be achieved.

Different approaches to assessing the effectiveness of screening in terms of mortality reduction were presented. It was shown that mortality reduction due to screening can be obtained in several ways other than from randomized trials comparing screening with no screening. These include: 1) direct comparison of screened with nonscreened cohorts, 2) by modeling and 3) from life tables and actuarial analysis as used in the insurance world. The results of these different methods were remarkably consistent, and indicated a significant lung cancer specific mortality reduction. It was pointed out that the I-ELCAP approach which focuses on curability gain resulting from screening provides an estimate of the reduction in mortality that can be achieved if screening is continuous and a well-defined regimen of screening is used.

The current and different recommendations for screening for lung cancer around the world were discussed. Clearly Japan has a comprehensive lung cancer screening program based in part on chest radiographs and in part on CT scans. Essential inputs for cost-effectiveness assessment of lung cancer screening were also presented. Efforts are ongoing to develop guidelines for CT screening for lung cancer. Identification of the critical parameters to be addressed in any screening program were discussed and a preliminary draft of some of these elements is to be prepared.